

REMARKS

I. INTRODUCTION

In response to the Office Action dated November 24, 2004, no claims have been canceled, amended or added. Claims 1-12 remain in the application. Entry of these remarks, and re-consideration of the application, is requested.

II. PRIOR ART REJECTIONS

A. The Office Action Rejections

In paragraphs (2)-(3) of the Office Action, claims 1, 2, 5, 6, and 9-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Barnes et al., U.S. Patent No. 6,711,147 (Barnes). In paragraph (11) of the Office Action, claims 3, 4, 7, and 8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Barnes as applied to claim 1, and further in view of Olkkonen, WO 98/43456 (Olkkonen).

Applicants' attorney respectfully traverses these rejections.

B. Applicants' Independent Claims

Applicants' independent claim 1 is generally directed to an internet protocol-based cellular telephone communications system, comprising:

- a router;

- a foreign agent (FA), coupled to the router;

- a base transceiver station (BTS), coupled to the router, for communicating with a mobile telephone within a transmission area associated with the base transceiver station, wherein the router communicates with the base transceiver station using a cellular network interface; and

- a home agent (HA), coupled to the router, wherein the home agent communicates with the router and the foreign agent for registering mobile telephones and transmitting messages using an internet-protocol network separate from the cellular network;

wherein messages are transmitted using the internet protocol network between the home agent and the router, and messages are transmitted using the cellular network interface between the router and the base transceiver station.

Applicants' independent claim 6 is generally directed to an internet protocol-based cellular telephone communications system, comprising:

- a handoff server (HS);

a base transceiver station (BTS), coupled to the handoff server, for communicating with a mobile telephone within a transmission area associated with the base transceiver station, wherein the handoff server communicates with the base transceiver station using a cellular network interface; and

a home agent (HA), coupled to the handoff server, wherein the home agent communicates with the handoff server for transmitting messages using an internet-protocol network separate from the cellular network;

wherein messages are transmitted using the internet protocol network between the home agent and the handoff server, and messages are transmitted using the cellular network interface between the handoff server and the base transceiver station.

Applicants' independent claim 12 is generally directed to a method for communicating over an internet protocol-based communications network, comprising:

sending a message from a home agent (HA) to a router over an internet protocol based network;

forwarding the message from the router to a base transceiver station (BTS) using a cellular network interface, wherein the cellular network is not part of the internet protocol based network; and

forwarding the message from the base transceiver station to a mobile telephone that is within a geographical communications zone of the base transceiver station.

C. The Barnes Reference

Barnes describes a network, system and method for merging a packet service such as GPRS with a mobile IP is disclosed. The GPRS network includes a first base station for providing wireless access to a mobile node, a GPRS support node (GSN) connected to the base station, and a security gateway for connecting the GPRS network to a second network that may use mobile IP. The GSN is capable of creating an IP tunnel connecting it to the second network through the security gateway. The GSN is also capable of handling mobile IP specific messaging and converting the wireless access to mobile IP specific messaging.

D. The Olkkonen Reference

Olkkonen describes a mobile telecommunications network using ATM switching, which has a network element including an ATM switching function, which are controlled with same call and switching control operations as generally used for control of TDM switching field

E. Applicants' Claimed Invention Is Patentable Over The Reference

Applicants' attorney respectfully submits that Applicants' claimed invention is patentable over the cited references. Specifically, Applicants' attorney asserts that the references, taken individually or in combination, do not teach or suggest the specific combination of elements recited in Applicants' claims.

The Office Action states that the limitations of Applicants' independent claims can be found at col. 7, lines 16-29 and col. 7, lines 38-63. However, the Office Action admits that Barnes does not disclose that the device is a router. Nonetheless, the Office Action asserts that Barnes does disclose, as prior art, that the HA and FA are routers (col. 3, lines 34-37 and col. 3, lines 58-61). According to the Office Action, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the device be a router since the device contains the functionality of an HA and FA, which are routers.

Applicants' attorney disagrees. At the indicated locations, Barnes merely sets forth the following:

Col. 7, lines 16-63

Referring now to FIG. 4, a modified telecommunications network is illustrated with two GPRS networks 250, 252 and the mobile IP network 14. It is understood that the arrangement of networks (GSM/GPRS networks, internet, site intranet, and so forth) have been arranged in many different ways in the drawings. This is to show at least some of the many possible arrangements of networks that can benefit from the present inventions.

The GPRS network 250 connects to base station 16a, 16b, which are capable of establishing a wireless link with the mobile node 12. In the present example, the wireless link is a 2G/3G GSM radio access. The base station 16a includes an interface to a GSN/HA 254 which may, in some embodiments, use a VLR 256. The VLR 256 may be separated from the GSN/HA 254. For example, the VLR 256 may be the VLR 18a associated with the MSC 18 of FIG. 1. The GSN/HA 254 also utilizes a HLR 20, which in the present embodiment is located in the network 250. The HLR 20 is conventionally connected to the VLR 256 through a MAP interface. The base station 16b includes an interface to a GSN/FA 258 which may also include a VLR 260, similar to the GSN/HA 254 and the VLR 256.

The GSN/HA 254 and the GSN/FA 258 are GPRS service nodes that incorporate some new functionality that is discussed below. The GSN/HA 254 replaces the SGSN 30 and GGSN 40 of the GPRS network of FIG. 1. The GSN/HA 254 also takes on functionality similar to the home agent 106a of FIG. 2. For example, the GSN/HA 254 uses internet protocols instead of conventional telecommunications protocols (such as SS7) for communicating with other switching systems and/or networks. However, the GSN/HA 254 also includes the necessary components associated with conventional telecommunications to interface with the VLR 256 and the HLR 20.

The GSN/FA 258 also replaces the SGSN 30 and GGSN 40 of the GPRS network of FIG. 1. The GSN/FA 258 also takes on functionality similar to the foreign agent 106b of FIG. 2. As with the GSN/HA 254, the GSN/FA 258 uses internet protocols instead of conventional telecommunications protocols for communicating with other switching systems and/or networks. The GSN/FA 258 also includes the necessary components associated with conventional telecommunications to interface with the VLR 260 and the HLR 20. It is understood that, coincident with the GPRS network 250, GSM circuit-switched wireless telephone calls are also supported by one or more MSCs (not shown) and/or the GSN/HA 254, as well as the VLR 256, the GSN/FA 258, the VLR 260, and/or the HLR 20.

Col. 3, lines 34-37 (actually, lines 27-40)

Consider for example FIG. 2 of the drawings. The reference numeral 100 refers, in general, to a simplified conventional mobile IP network. The network 100 allows the mobile node 12 to communicate with a packet network 104, such as a wireless local area network, to further connect with a host 105 or to the internet. The mobile node 12 includes the necessary components (not shown) to establish a wireless connection to a home agent 106a. A home agent is a router on the mobile node's home network that maintains current location information for the mobile node and delivers packets to the mobile node when it is in away. Although the same mobile node 12 is described in FIGS. 1 and 2, it is understood that different equipment may actually be required for the different networks.

Col. 3, lines 58-61 (actually, col. 3, line 56 = col. 4, line 3)

The mobile node 12 may roam about the mobile IP network 100 by establishing wireless (or wireline) connections with various foreign agents 106b, 106c. A foreign agent is a router in a "visited" foreign network which cooperates with the home agent to complete the delivery of packets to the mobile node while it is away from home. A visited foreign network is a network other than a mobile node's home network, to which the mobile node is currently connected. The foreign agent maintains a visitor list of all the visiting mobile nodes. For the sake of example, the mobile node may roam to a location "A" and establish a wireless connection with foreign agent 106b in a first visited network, and then may roam to a location "B" and establish a wired connection with foreign agent 106c in a second visited network.

With regard to Applicants' independent claims 1 and 6, the above portions of Barnes do not describe an internet protocol-based cellular telephone communications system. Instead, the above portions of Barnes refer to a global packet radio service (GPRS), e.g., a packet data network, which operates in parallel with or coincident with a GSM cellular telephone system. See, e.g., col. 7, line 59, which states "[i]t is understood that, coincident with the GPRS network 250, GSM circuit-switched wireless telephone calls are also supported by one or more MSCs (not shown) and/or the GSN/HA 254, as well as the VLR 256, the GSN/FA 258, the VLR 260, and/or the HLR 20," and col. 1, line 48, which states "GPRS supports concurrent operation with existing GSM services for circuit-switched speech, circuit-switched data and the service management system ("SMS" or "the intelligent network") and is considered a long term replacement for signaling system 7 based SMS."

Consider also the statement at col. 2, line 3, which states "[f]or conventional wireless telephone calls, the base station 16 creates a voice and control link to a mobile switching center ("MSC") 18, which provides a voice link to a telephone network such as the PSTN," and the statement at col. 2, line 16, which states "[f]or packet data calls, the network 10 includes several GPRS network elements, including GPRS support nodes ("GSNs")." Thus, the discussion in Barnes related to GPRS concerns "packet data" and the connection of "mobile nodes" to "hosts" on a packet network, but not voice calls by "mobile telephones" in "cellular telephone communications networks."

With regard to Applicants' independent claim 1, the above portions of Barnes do not describe the combination of a router, a foreign agent (FA) coupled to the router, a base transceiver station (BTS) coupled to the router, and a home agent (HA), coupled to the router. Indeed, the Office Action asserts that the FA and HA themselves are routers, even though Applicants' claim requires that both the FA and HA be coupled to a separate router rather than each other. Essentially, the Office Action eliminates the "router" element from Applicants' claim, by imputing it to the HA and FA. However, this is an improper interpretation of Applicants' claim.

With regard to Applicants' independent claim 6, the above portions of Barnes do not describe the combination of a handoff server (HS), a base transceiver station (BTS) coupled to the HS, and a home agent (HA), coupled to the HS. Again, the Office Action asserts that the HA is itself an HS, even though Applicants' claims require that the HA be coupled to a separate HS rather than itself. As noted above, the Office Action eliminates the "handoff server" element from Applicants' claim, by imputing it to the HA. However, this is an improper interpretation of Applicants' claim.

With regard to Applicants' independent claim 12, the above portions of Barnes do not describe the combination of sending a message from a home agent (HA) to a router over an internet protocol based network, forwarding the message from the router to a base transceiver station (BTS) using a cellular network interface, wherein the cellular network is not part of the internet protocol based network, and forwarding the message from the base transceiver station to a mobile telephone. As noted above, the Office Action asserts that the HA itself is a router, even though Applicants' claim requires that the HA be coupled to a separate router. Again, the Office Action eliminates the "router" element from Applicants' claim, by imputing it to the HA. However, this is an improper interpretation of Applicants' claim.

Finally, with regard to Applicants' independent claims 1, 6 and 12, the above portions of Barnes do not describe a router or handoff server that communicates with a base transceiver station using a cellular network interface. FIG. 4 in Barnes merely illustrates, as described at col. 7, line 27, that "[t]he base station 16a includes an interface to a GSN/HA 254 which may, in some embodiments, use a VLR 256." Nowhere does Barnes indicate what type of interface exists between the base station 16a and the GSN/HA 254. Specifically, Barnes does not describe the interface as being a cellular network interface.

Olkkonen does not overcome these deficiencies of Barnes. Recall that Olkkonen was cited only against Applicants' dependent claims, and only for teaching the use of ATM in cellular telephony. Thus, even when combined, Barnes and Olkkonen do not teach all the elements of Applicants' claims.

Moreover, the various elements of Applicants' claimed invention together provide operational advantages over Barnes and Olkkonen. In addition, Applicants' invention solves problems not recognized by Barnes and Olkkonen.

Thus, Applicants' attorney submits that independent claims 1, 6, and 12 are allowable over the references. Further, dependent claims 2-5 and 7-11 are submitted to be allowable over the references in the same manner, because they are dependent on independent claims 1, 6, and 12, respectively, and thus contain all the limitations of the independent claims. In addition, dependent claims 2-5 and 7-11 recite additional novel elements not shown by the references.

III. CONCLUSION

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited. Should the Examiner believe minor matters still remain

that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.

Respectfully submitted,

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